ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF PATIENT SATISFACTION AND ASSOCIATED FACTORS IN TELEMEDICINE SERVICE PROVIDING ORGANIZATIONS IN ADDIS ABABA, ETHIOPIA.

BY: Kenean Mitiku (BSc, BA)

ID No: GSR /6733/14

Advisors' name

1. **Primary: Dr. Mesfin Addise (MD, MPH)**
2. **Secondary: Mrs. Adiam Nega (BSc, MPH)**

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I, the undersigned MPH student, declare that I have submitted my original work on a title "**ASSESSMENT OF PATIENT SATISFACTION AND ASSOCIATED FACTORS IN TELEMEDICINE SERVICE PROVIDING ORGANIZATIONS IN ADDIS ABABA, ETHIOPIA".**

Submitted by:

Kenean Mitiku _____

This thesis work has been submitted with my approval as an Advisor

Approved by:

Dr. Mesfin Addise (MD, MPH) _____

Signature

Mrs. Adiam Nega(Bsc, MPH) _____

Signature

EXAMINERS:

_____ _____

Internal examiner Signature

_____ _____

External examiner Signature

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I would like to express my gratitude for Addis Ababa University for giving me this chance to pursue my MPH class. Then my sincere gratitude goes to my advisors Dr. Mesfin Addise and Mrs. Adiam Nega for their remarkable guidance, provision of constructive comments and support during preparation of this proposal thesis. I would also like to thank all of my family and friends for their unreserved support and encouragement during the whole process to this research. Above all I would like to thank my GOD, without him, nothing is possible

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Abbreviations and Acronym

AA: Addis Ababa

AARHB: Addis Ababa Regional Health Bureau

AAU: Addis Ababa University

AOR: Adjusted Odds ratio

COR: Crude Odds ratio

Covid 19: Corona virus disease 2019

FMHACA: Food, Medicine and Healthcare Administrative control authority

MOH: Ministry of Health

SPH: School of public health

SPSS: Statistical Package for Social Science

VIF: Variance inflation factor

WHO: World Health Organization

Abstract

Background: Telemedicine is the provision of health care services, clinical information, and education in all specialties over different sort of technologies including the Internet, mobile phones and electronic medical records. Assessing the level of patient satisfaction in Telemedicine program, allows continual improvement in the design, alternative, or choice of equipment, and program administration and management for the health service provider. Hence, this study is intended to fill this gap in evidence in the study area assessing patient satisfaction so that interventions can be taken to improve of Telemedicine service quality in Ethiopia.

Objective: To assess level of patient satisfaction and associated factors among service users of Telemedicine service providing organizations in Addis Ababa, Ethiopia.

Methods: Facility based, cross-sectional study design was conducted from April to May 2023 in Addis Ababa. A total of 410 patients were selected by non-probability voluntary sampling method from five service providing organizations that were selected randomly. Data was collected based on an online self-administered Telemedicine satisfaction questionnaire using pre tested structured questioner. For the analysis, SPSS version 25 was used. Ethical approval for this study was obtained from the Research Ethical Committee of SPH, AAU, Permission letter was written for the selected telemedicine organizations, during data collection informed consent was obtained from the participants, after the necessary explanation was given. Based on the mean value among the factors related questions asked. Bivariate and Multivariate logistic regression was done to identify factors that were associated with diabetic self -care practice. The odds ratio with 95% CI was used to determine the association. A statistical significance was declared at p value <0.05.

Result: Among 373 respondents about 205(54.7%) were satisfied. Age ranging from 35-44(AOR=0.341, 95%CI; 0.127-0.919), male gender(AOR=0.233, 95%CI; 0.128-0.425), hotline type of telemedicine(AOR = 0.607,95%CI;0.369-0.999), patients with no previous experience(AOR=0.287, 95%CI; 0.161-.513),patients who thought the service was inexpensive(AOR =0.422, 95% CI; 0.247-0.719) were significantly associated with overall telemedicine patient satisfaction.

Conclusion: The study demonstrated more than half of the patients 57.4% were satisfied but still substantial amount (42.7%) of respondent were dissatisfied. Telemedicine patient satisfaction was found to be associated with age, gender, previous experience and cost perception.

1. Introduction

1.1 Background

Telemedicine is one of the leading innovations in health services, both from the technological and sociocultural aspects since it mainly aids the accessibility and efficiency of health care services and quality improvement in the medical care and organizational [1].

According to WHO definition Telemedicine is "The delivery of health-care services, where distance is a critical factor, by all health-care professionals using information and communications technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and the continuing education of health-care workers, with the aim of advancing the health of individuals and communities".

Some of the benefits of Telemedicine are reducing travel burden, providing access to a wider range of specialist advice and services, by removing the distance and time management barrier using technology it helps to deliver faster, more efficient health care, it can also be used for general health promotion [2].

During the outbreak of corona virus (COVID-19), Telemedicine played a major role in continuity of routine care to patients, reducing the exposure risk of both patient and provider globally. Hence, post the pandemic, there has been an increment in the demand for Telemedicine services. In well developed countries like the United States there are over 200 Telemedicine networks and more than 3,500 services. A report from United States Centers for Medicare and Medicaid Services showed Telemedicine visits increase pre-COVID from 13,000 to 1.7 million in which is much greater compared to other countries such as the European Union, Japan, and South Korea[3].

In developing countries like South Africa since COVID-19, there has been a significant increase in Telemedicine utilization. Records showed that, Tele-triage has reduced the burden on health facilities by saving 95% of face to-face consultations, and in general practice services, 80% of the problems are resolved by teleconsultation facilities [3].

In 1980, Ethiopia and other sub Saharan countries like Ghana, Gambia and Nigeria established the Health Net Telemedicine project. After alliance of Ethiopian and government foreign for implementation of Telemedicine in 1997, Ethiopia piloted the Telemedicine project which consisted of Tel-Education, Tel-Dermatology, Tel-Pathology, Tel-Radiology and Tel-Ophthalmology. Then in 2015 Ethiopia introduced the national e-health policy initiative [4].

Satisfaction is an standard indicator of health care service performance. It indicates patients' values and expectations regarding various features of health service. When care expected and received match, then patients are satisfied. Thus, patients' actual experiences heavily affects the level of satisfaction. Patient satisfaction is very important for Telemedicine to be a feasible mode of service delivery. Satisfaction with health care is closely coupled with improved patient engagement and treatment compliance for a spectrum of conditions in different clinical settings [3].

These satisfaction studies also help the healthcare provider to identify problems in healthcare and evaluate the care they provide, to understand the patient– doctor communication process and predict patient health-related behaviour and to anticipate patient utilization of care, continuity with the same provider and compliance or service reuse as well as recommending that service to others [5].

Many studies show that satisfaction with Telemedicine services is significantly affected by the performance and ease of use of the platform. Telemedicine Patients' satisfaction in developing countries could be influenced by plenty of factors, including platform ease of use, effectiveness, facilitating condition, and patient- provider relation. Moreover, patient satisfaction can be dependent on Socio-demographic factors such as gender, age, education, and psycho social factors [6].

Currently, patient satisfaction is being increasingly used as a major criteria to evaluate and improve the quality of care in health care setting. Being one of the developing countries, Ethiopia tried to integrate technology in all areas of healthcare to maximize the delivery of healthcare to patients with different medical conditions and is facing much challenge in adaptation process in the community**,** Therefore this study intends to assess telemedicine service patient satisfaction and identify factors related to it.

1.2 Statement of the Problem

Patient satisfaction is considered an important indicator of improvement in healthcare quality. Information on the level of patient satisfaction in Telemedicine program, allows continual improvement in the design, alternative, or choice of equipment, and program administration and management for the health service provider [7].

Globally, considering the success of Telemedicine services during challenging times of the pandemic, there has been an increase in usage of Telemedicine services supported health care enhancement, professional and patient education, and disease surveillance and prevention. However, currently there is knowledge gaps on patient satisfaction with Telemedicine, including through the use of video conferencing, using robust methodology, and also including patient satisfaction care with the method of providing this service in Africa specifically in Ethiopia. Therefore, it is important to assess patient satisfaction with beneficiaries and identify any shortfalls that can be addressed [8].

Satisfaction in usage of Telemedicine services is rising as one of the challenges in optimal utilization of the service. Despite the importance of Telemedicine, there is a inadequacy of research on exploring patients' satisfaction with the adoption of Telemedicine services [6].

Telemedicine is health care delivery using the use of telecommunication, it is considered as a cost effective solution to fill the gap created by the lack of highly qualified experts in different fields of medicine both in rural and urban areas in Ethiopia. It allows for medical professionals to access the under served areas with out distance as a barrier and provide specialist support to the hospitals in need. This in turn helps to address the problems facing the health care system of the country, which are: inadequate access and uneven resource distribution. It may also enable the cities as a means to get access to advanced health care systems and specialist support from physicians living abroad[9].

Even though there are many studies done in different setting that show how the various programs of Telemedicine supported fighting the burden of COVID-19, there is major lack of studies on Telemedicine progress to serve as a baseline for indicating users' satisfaction with Telemedicine services this in turn limits the extent to which various countries assess the progress made in terms of Telemedicine implementation [4].

There is a gap of study on assessment of level of patient satisfaction and identifying important factors influencing patient satisfaction in Telemedicine, particularly in Addis Ababa, Ethiopia. Hence, this study attempts to contribute to fill this information gap.

1.3 Significance of the Study

The finding from this study could give inputs in assessing satisfaction level and identifying factors that are associated with patient satisfaction in Telemedicine in Ethiopia. Besides, assessing level of patient satisfaction might aid in taking measures to increase quality of service provided.

The findings of this study would help generate information for the health care providers in Telemedicine service for taking measures and further amendment of service delivery and programs. Furthermore, the finding could also assist to see from patients perspective about barriers and improvement area for Telemedicine service across the country. Finally, the finding can be used as baseline information for other researchers who engaged in related studies and the findings may be used as a source of information.

2. Literature review

2.1 Overview of Telemedicine and patient satisfaction

2.1.1 Telemedicine

Telehealth is a comprehensive term of use of technology for health and related services that includes Telemedicine. The term Telemedicine refers to the provision of health care services, clinical information, and education in all specialties over different sort of technologies including the Internet, mobile phones and electronic medical records [9]. It enhances remote provision of healthcare using technology in timely manner with reduced financial costs of travel and others and limiting the need for patients' physical attendance in clinic, decreasing the inconvenience to caregivers and social factors, improving access to care and medical information. Therefore, increasing quality of services and patient satisfaction [10].

2.1.2 Patient Satisfaction

Patient satisfaction is evaluation of whether or not patients or users expectation is met. It is a growing concern in all aspects of healthcare, and as the voice of the customer, needs to be continuously heard the healthcare organizations continue to develop more technology-based care that meets the needs of patients and providers. Measurement of patient satisfaction allows providers to tailor their practice to patient needs [10].

Satisfaction studies help to understand more about patients' experience of healthcare, promote co-operation with that care and increase compliance with treatment. IT also helps the health provider to identify problems in healthcare and evaluate that care , to understand the patient doctor communication process and predict patient health-related behaviour and to predict patient utilization of care, continuity with the same provider and compliance[3].

2.1.3 Telemedicine and patient satisfaction

In Telemedicine, patient satisfaction is an crucial feature to consider because Patients' perceptions, satisfaction and future needs with Telemedicine may be important in future acceptance and adoption of Telemedicine [5].

It is considered that Telemedicine depends on reports of its patient satisfaction because the patients could be the only source of information that report how they were treated and whether or not the treatment received met the their expectations. If the patients are not happy

with the Telemedicine care they received, the service becomes unnecessary and costly. With the growth in usage of Telehealth, it is essential to uphold the key quality indicator which is patient satisfaction no matter what the mode of service delivery [6].

From a review report done on studies conducted in developed countries/states the level of satisfaction reported was such as New York City (94.9%), Los Angeles (82.7%), UAE (81%), and Saudi Arabia (77.9%) , and from studies conducted in developing countries which includes Philippines (82%), India (73.9%; 51.3%), and Iran (43.4%) [3].

2.2 Factors associated with patient satisfaction in Telemedicine

2.2.1 Socio-demographic characteristics of the patient

Socio-demographic factors are the most common factors studied where age, educational and occupational status mainly determines the patients' perception of Telemedicine. A study done in Pakistan showed that, found that gender, education, and age were significantly associated with the ease in technology with evidence 95.6% having secondary school and above educational status and 59.4% being male also 91.7% aged above 21. Similarly, a study from Bangladesh reported about 65.1% of the respondents have University degree and none were illiterate, from the gender distribution 68.4% males and 31.6% were female and 36.7 % aged between 31 and 40. However a Saudi Arabian study only mentioned age which showed about 61.1 % of the respondents aged between 26 to 45 and Participants from 18 to 25 years had a significantly higher mean satisfaction score compared to the other participants [12, 6, 13].

2.2.2 Availability of Telemedicine services

The availability of technological resources and healthcare provider is one of factors associated with patient satisfaction. Studies show that one of the major challenge faced by the study participants is the technological issue. Participants found their satisfaction level with the Telemedicine services to be dependent on how smoothly a teleconsultation has gone. Video and audio quality, stable network connection, and access to technological services were found to be major ones associated with Telemedicine services [5].

In Telemedicine, technology have a important role in addressing barriers to health care access for users [14]. The dimensions considered are: ease of registration/ setting appointment, quality of the visual image and audio. A study done in Saudi Arabia revealed that most of the participants responses are more or less satisfied on satisfaction indicating 52% were satisfied

with the ease of registration and scheduling, 38.8% with the quality of the visual image and audio [13]. Similarly on a study done in Pakistan more than 50% of the patients strongly agreed with being able to talk, see, and hear, and comfortably communicate with their health care providers [12].

2.2.3 Accessibility of Telemedicine services

When considering accessibility of Telemedicine services convenience, comfort, ease of access, and waiting time were found to be basic factors that increase the patient satisfaction level of Telemedicine service.

A study by Atmojo et al.[18], the 2020 patient satisfaction and cost-effectiveness of Telemedicine service shows that Telemedicine services help patients reduce their need for travel, saving them money; and reduce their absence from the workplace to visit the clinic in person. In addition, Telemedicine services have been able to demonstrate significant savings in healthcare costs in specific specialties such as pediatrics [11].

A study done in Pakistan revealed that when patients were asked about the convenience of using Telemedicine, 63.75% of patients strongly agreed that this service saves them travel time. Only 1.59% of patients strongly disagreed. This service allows them to save time. More than 96.41% of patients agree that Telemedicine saves travel time[12]. The patients also admitted that if Telemedicine services were not available as an alternative, they might have to miss their work to avail health care services. But with the ease of access to Telemedicine, and find it easier to get the required health care without missing out on their work schedule [3].

From a study done in Saudi Arabia it is reported that 40.5% of the participants were comfortable of Telemedicine setting, and 43.5% were able to talk freely [20].

2.2.4 Individual factors

Previous experience and cost perception towards usage of Telemedicine are important factors to consider when measuring patient satisfaction. Cost perception can be defined as the degree to which patients perceive the cost or monetary expense of using telemedicine, considering factors such as cost savings as relating to net benefits on the organizational level[26]. Researches show that measuring patients experience can reveal important gaps and have wide implication service quality and patients with positive experience are more likely to engage in repetitive use of service, adherence to treatment and better health outcome [19].

A study done in Bangladesh reported that 56.8% had 2-4 years of experience using Telemedicine in healthcare [6] and a study in Pakistan reported that when asked if patients would use Telemedicine again, 47.41% strongly agreed, whereas only 1.99% strongly disagreed [12].

More than 74% of the participants from study done in Saudi Arabia had used these Telemedicine services more than once and more than 93% participants considered advising others to use the Saudi MOH Telemedicine services [20].

2.3 Conceptual frame work

There is a complex set of interactions between patient satisfaction and the associated factors. From the factors that affect patient satisfaction are socio-demographic including age, gender, educational status and the other characteristics like accessibility that includes convenience, user friendliness and time, individual factors including previous experience and cost perception and availability including quality of visual image and audio, and ease in registration and appointment setting.

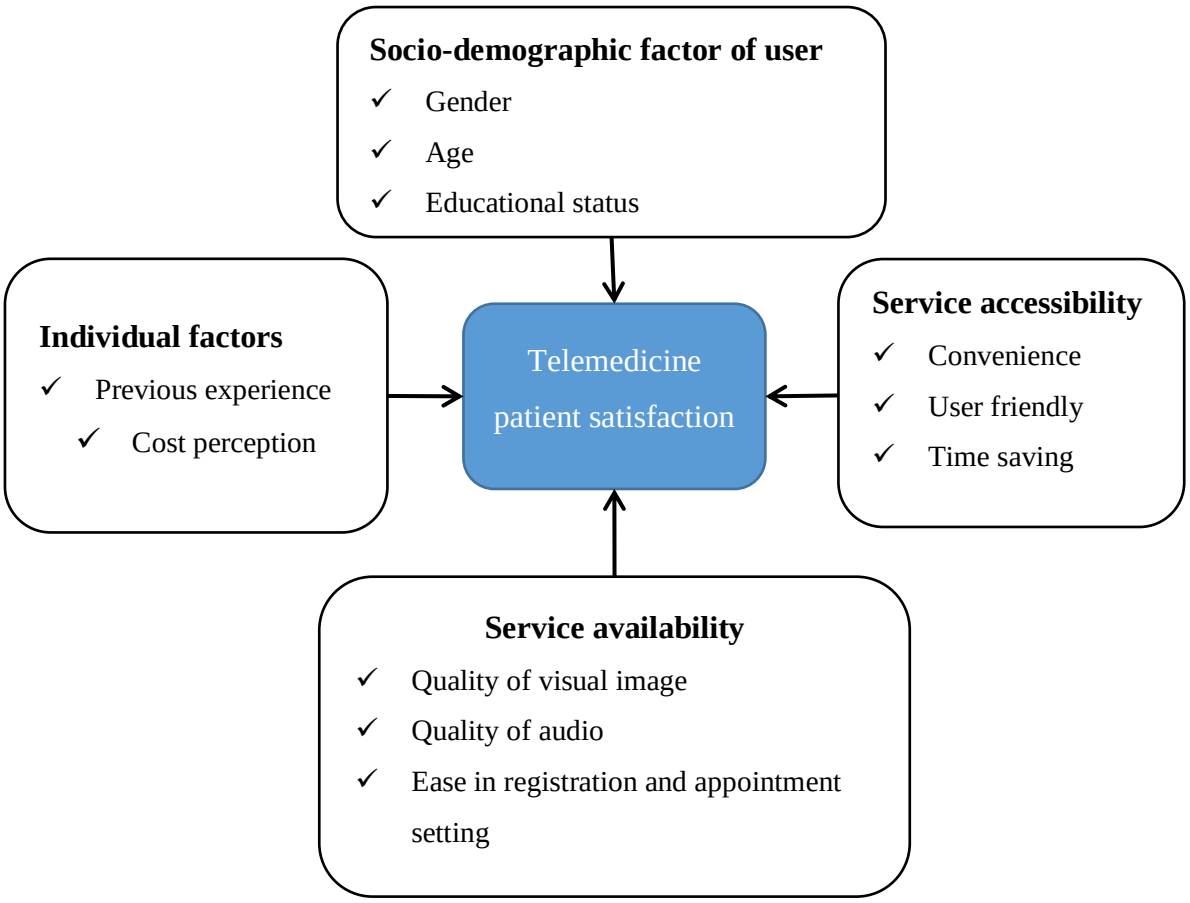

Figure 1. Conceptual framework on assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

Source: Developed from different kinds of literature [3, 4, 10, 12, 13].

3. Objective

3.1 General objective

- To assess level of patient satisfaction and associated factors among service users in telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023 g.c

3.2 Specific objectives

- To assess level of patient satisfaction among telemedicine service users.
- To determine factors associated with patient satisfaction among telemedicine service users.

4. Methods and materials

4.1 Study Setting

The study was conducted in Addis Ababa, the capital city of Ethiopia and a Chartered city having 11 Sub city Administrations. Addis Ababa covers an area of 527 square kilometers with 3,384,569 regional total populations in the last 2007 census according to Addis Ababa Regional Health Bureau (AARHB). And as report of world population review stated Addis Ababa's 2023 population is now estimated at 5,460,591[25].

There are about 15 Telemedicine service providing organizations in Addis Ababa, Ethiopia, From which only 5 of them have renewed registration certificate by FMHACA in 2023. They are Liyana Telehealth service, Redat Home based care and Telehealth, Yutoria Telehealth service, We care Digital health and Tsenat Telehealth service.

Telemedicine service specialties currently practiced in Ethiopian telemedicine network include Tel-Pediatrics, Tel-Radiology, Tel-Cardiology, Tel-Dermatology, women health, Tel-Ophthalmology, Tel-Oncology, Tel-Obstetrics, Tel-Pharmacy, Tel-Rehabilitation, Tel-Radiology and Tel-Psychiatry.

This study was conducted in the selected Telemedicine service providing organizations in Addis Ababa from April - May 2023 g.c.

4.2 Study design and period

4.2.1 Study design

An institution-based cross sectional study with a quantitative approach was conducted

4.2.2 Study period

This study was conducted from April - May 2023 g.c.

4.3 Population

4.3.1 Source population

All patients who visited the selected telemedicine service

4.3.2 Study population

All selected patients who visited the selected telemedicine service

4.3.2 Eligibility criteria

4.3.2.1 Inclusion criteria

- Patients aged 18 years and above who were willing to participate in the study

4.3.2.2 Exclusion criteria

- Patients with any health problem that limits their participation in the study.
- Participants below age of 18 years

4.4 Sample size determination

The total sample size was calculated by using online open source (open Epi version 3). Using the overall satisfaction 54.7% in Saudi Arabia [13], considering the following assumption:

- 95% confidence interval
- 0.05 margin of error
- 5% Alpha
- 5% non-response rate

Accordingly, the sample size is calculated was 381. When adding 5% for the non-respondent rate, the final sample size would be **n= 400**

Table 1 sample size calculation for associated factors on assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

Variable	% of cases	CI	AOR	power	ratio	Final sample size(with 5% non response
Occupational status	62.5%	95%	1.96	80%	1:1	324
Consultation department	59.6%	95%	2.55	80%	1:1	172
Educational status	17.8%	95%	1.68	80%	1:1	225
Previous experience	75.8%	95%	3.28	80%	1:1	206

4.5 Sampling procedures

Among Telemedicine programs found in the Addis Ababa, Five Telemedicine providing organizations were selected randomly.

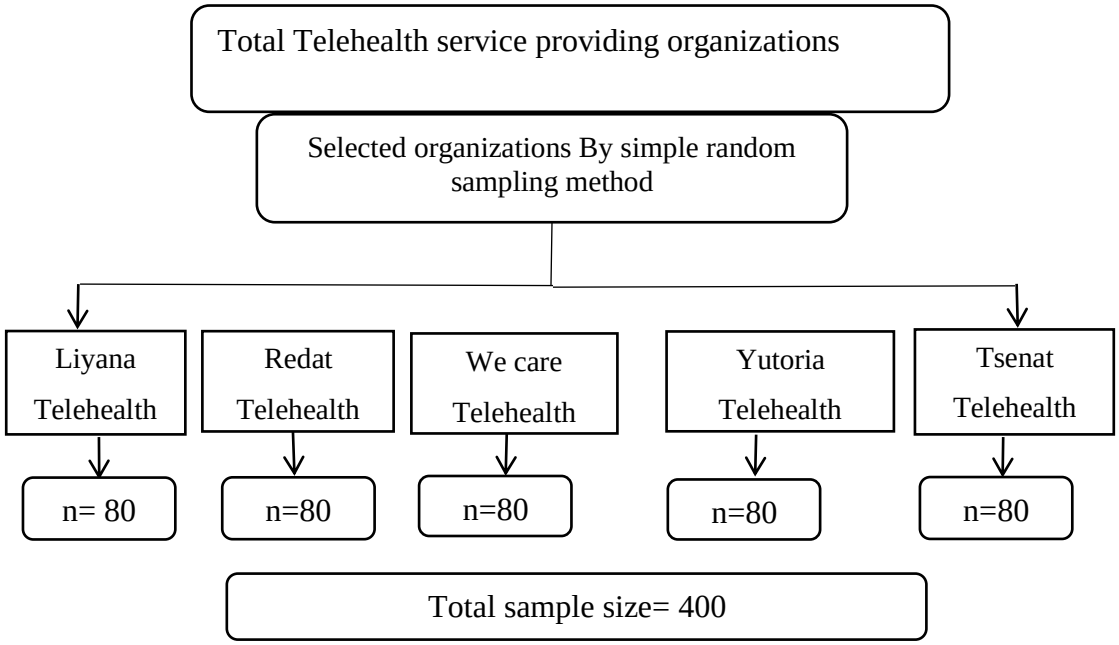

Figure 2 Schematic presentation of sampling procedures of assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

4.6 Data collection procedures

Data was collected by an online self-completed questionnaire using Telemedicine Satisfaction Questionnaire, a validated and reliable tool with good internal consistency 0.93, adopted from Yip MP et al [5] and relevant literature [6, 9, 10, 12, 13]. The survey was disseminated through the Telemedicine program platforms to reach the patients visiting the platform seeking the service provided, which was adopted and modified to elicit participants' socio-demographic data, participants' satisfaction, and factors influencing satisfaction in Telemedicine, their views on Telemedicine services in Ethiopia.

The questionnaire was disseminated as an exit interview after acquiring verbal consent for participation through email or phone number they used o access the service.

The satisfaction of the participants was assessed by slightly modified questions on a Likert scale that has five score, ranging from 1 to 5 that is "very dissatisfied" to "very satisfied" response respectively.

The questionnaire was initially prepared in English then translated in to local language (Amharic) by an individual who has good ability of the two languages then translated back to English by different person to ensure consistency. A week prior to the actual data collection, A pre-test was done on 5% of telemedicine service users which were not included in the actual data collection. Findings of the pretest were incorporated to modify and clarify the collection tool before the actual data collection.

4.7 Study variables

4.7.1. Dependent variables

- Patient satisfaction with telemedicine service

4.7.2. Independent variables

- Socio-demographic variables (sex, age, educational status)
- Individual factors including previous experience and cost perception
- Service availability variables (ease in registration and appointment setting, quality of visual image, quality of audio)
- Service accessibility variables (convenience**,** user friendly, time saving)

4.8 Operational Definition

- **Telemedicine service providing organizations:** health service organizations that use of digital technologies to deliver medical care, health education, and public health services by connecting multiple users in separate locations [2].
- **Ease in registration and appointment setting**: is the degree to which patients are satisfied with the scheduling and waiting for an appointment with a medical provider [8]
- **Quality of visual image**: Subjective quality assessment by users visually analyzing and rating the images or videos by comparing them with the originals[5].
- **Quality of audio:** Subjective quality assessment by users whether there is difficulty in talking or hearing over the connection or not[5].
- **Convenience:** patients' perception in terms of distance traveled and time away to get service offered [17].
- **User friendly:** is the extent to which patients perceive that using the Telemedicine system will would minimize physical and mental effort [8].

- **Previous experience:** patients visit the telemedicine service for first time or not[5].
- **Cost perception:** is the extent to which patients perceive that using the Telemedicine system is expensive or not[17].
- **Overall satisfaction:** the sum of all 16 indicators in the questionnaires assessed using Likert scale adapted from Yip MP et al[5].
- **Satisfied:** a score of mean average greater than 8 overall satisfactions.
- **Not satisfied:** a score of mean average less than or equal to 8 overall satisfactions.

4.9 Data Quality Assurance

The quality of data was assured before, during and after data collection process. **Prior to data collection**: objective based and standardized questionnaire was prepared, pre-test of the questionnaire for its understand-ability was done on 5% of sample on volunteer individuals in the facilities which were not included in the actual data collection.

During data collection: the supervisor closely followed the day-to-day data collection process and ensures completeness and consistency of questionnaire administered each day.

Post data collection: the collected information was rechecked for its completeness and consistency by the principal investigator before transferring in to computer software. Non overlapping numerical code was given for each question and the coded data was entered and cleaned in SPSS version 25 statistical software template.

4.10 Data Analysis procedures

The collected data was checked for its completeness manually and then entered and analyzed using SPSS version 25 statistical software package. Descriptive statistic including proportion, percentage, ratios, frequency distribution, mean and standard deviation was used to describe the data on patient satisfaction and the factors related.

Data was collected using Google forms platform in web page address link filled by the patient him/herself or immediate care taker. The responses were directly transferred to computer through email then were checked for its completeness. For the analysis, the data was exported to SPSS version 25.

A bi-variate logistic regression model analysis was done to see the association between the explanatory and outcome variables. Then, multivariate logistic regression analysis was employed by selecting only variables with P-value <0.25 in the bi-variate analysis. Odds ratio with 95% C.I was used to measure the strength between dependent and independent variables. P value < 0.05 was used to determine level of statistical significance.

4.11 Ethical consideration

Ethical approval for this study was obtained from the Research Ethical Committee of school of public health, Addis Ababa University, Permission letter was written for the selected telemedicine organizations, during data collection informed consent was obtained from the participants, after the necessary explanation about the purpose, benefits and risks of the study and their right on decision to participate in the study. All the interviews with respondents were made under strict privacy. After getting informed consent from the respondents the right of the respondents to refuse answer for few or all of the questions was respected and assurance was given for participants to withdraw or not to participate in the study without any prejudice.

4.12 Dissemination of results

The final report of the study was submitted to College of Health Sciences School of Public health for the partial fulfillment of master degree (MPH). The finding will be submitted to the involved Telemedicine service providing organizations. Further attempt will be made to disseminate it through publication on the peer-reviewed reputable journal for public utilization of the finding.

5. Result

5.1 Socio-demographic characteristics of service users

From a total of 400 sample size taken for this study, 373 respondents participated yielding a response rate of 94%.

Among the 373 respondents more than half of the service users are female (51.5%) and 25.6% of the respondents were in the age group of 35-44 and more than three forth of the respondents' education status 75.4 % had degree and above.(Table 1)

Table 2 Socio-demographic characteristics of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023 (n=373)

variables	categories	Frequency	percentage
Patient age	<18	56	15
	18 - 24	24	6.4
	25 -34	25	6.7
	35-44	90	24.1
	45-54	96	25.7
	55-64	34	9.1
	≥65	48	1.29
	Total	373	100
Gender	Male	181	48.5
	Female	192	51.5
	Total	373	100
Education	below secondary	-	-
	Secondary school	23	6.2
	Diploma	69	18.5
	Degree	202	54.2
	masters and above	79	21.2
	Total	373	100
Occupation	Student	38	10.2
	Self employed	84	22.5
	Employed	80	48.3
	Unemployed	42	11.3
	housewife	29	7.8
	Other(Specify)	-	-
	Total	373	100

5.1.2 Service use information

More than one third of the respondents used the hotline telemedicine health service (46.6%). and 39.8% of the respondents attended internal medicine related cases clinic, while 20.6% of the respondents attended the service for surgical related cases. About 16% of the users paid

less than 300 ETB for the service they received. Among the 373 respondents of the users 11% spent less than 15 min to schedule appointment/registration.

Table 3. Clinical characteristic information among users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023 (n=373)

Variables		Frequency	percentage
Service user	self	150	40.2
	other	223	59.8
Service user for others	Spouse	53	23.76
	Mother/ father	64	28.69
	Son/ daughter	78	34.97
	Relatives	58	26
	Other	8	3.58
	Total	223	100
Type of telemedicine used	Telephone	144	38.6
	Virtual clinic	55	14.7
	Hotline	174	46.6
	Total	323	100
Type of health clinic attended	Internal medicine	148	39.8
	Pediatrics	74	19.8
	Surgery	77	20.6
	Gynecologic and obstetrics	74	19.8
	Total	373	100
How much did you pay for the Telemedicine service	<300 ETB	60	16.1
	300- 500 ETB	132	35.4
	500-1000 ETB	164	44
	> 1000 ETB	17	4.6
	Total	373	100
Time taken schedule your appointment or registration	< 15 min	41	11
	15- 30 min	214	57.4
	30- 60 min	118	31.6
	> 60 min	-	-
Time spent with the doctor	< 15 min	93	24.9
	15- 30 min	261	69.9
	30- 60 min	11	2.9
	> 60 min	8	2.1

5.2 Factors related to telemedicine service use

5.2.1 Individual factors of service users

Among the 373 respondents, 64.9% are first time users, and more than half of the respondents 55.8% consider telemedicine service expensive, majority of the respondents (79.9%) agreed that Telemedicine services has made healthcare easier.

Table 3. Individual factors of of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023 (n=373)

variables		Frequency	percentage
First time visit	yes	242	64.9
	No	131	35.1
Think telemedicine is expensive	yes	165	44.2
	No	208	55.8
Telemedicine services has made healthcare easier	yes	298	79.9
	No	75	20.1

5.2.2 Accessibility of the telemedicine service

Among the 373 respondents (49.6%) agreed they were able to talk freely and (49.6%) were comfortable while communicating with the provider. About 17.4% of the respondents disagreed about hearing the health provider clearly while 18.2% responded neutral.

Table 4. Percentage distribution of accessibility response of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

Variables	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
I was able to talk freely	28 (7.5%)	47 (12.6%)	113 (30.3%)	135 (36.2%)	50 (13.4%)
I felt comfortable during communication	28 (7.5%)	46 (12.3%)	114 (30.6%)	122 (32.7%)	63 (16.9%)
My provider explained how my confidentiality is protected.	40 (10.7%)	26 (7%)	133 (35.7%)	117 (31.4%)	57 (15.3%)
My privacy was respected.	40 (10.7%)	67 (18%)	62 (16.6%)	161 (43.2%)	43 (11.5%)
I can hear the health provider clearly	28 (7.5%)	37 (9.9%)	68 (18.2%)	202 (54.2%)	38 (10.2%)

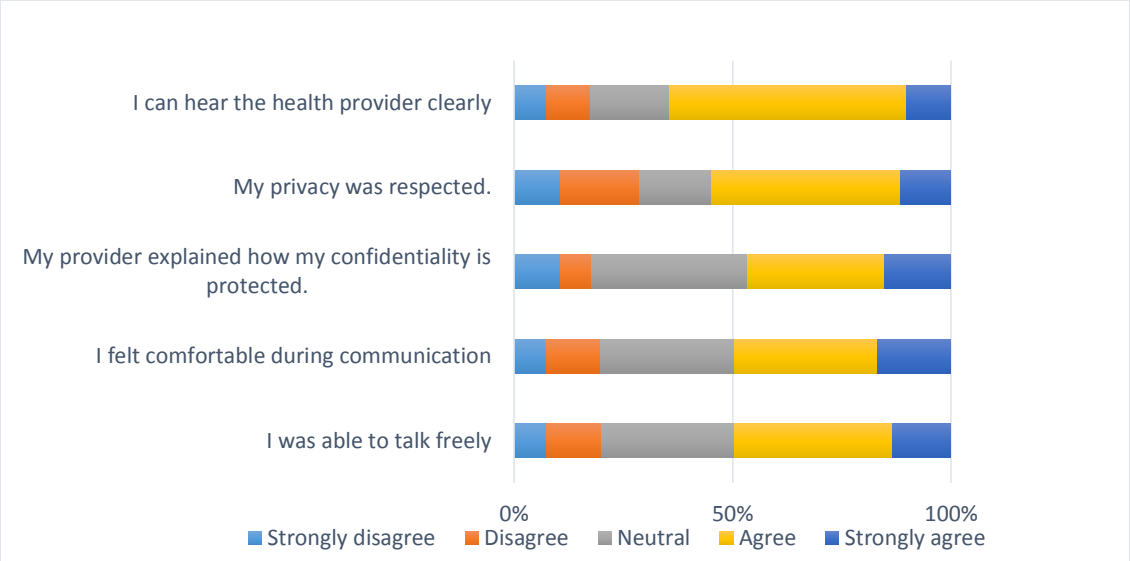

Figure 3. Percentage distribution of accessibility response of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

5.2.4 Availability of the telemedicine service

From the 373 respondents 10% of them disagreed Telemedicine improving their access to healthcare services. 22% of the respondents agreed they needed assistance while using the system. Majority of the respondents agreed telemedicine service saved time travelling to hospital.

Table 5. Percentage distribution of availability response of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

Variables	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
It was easy to schedule registration / appointment	47 (12.6%)	63 (16.9%)	101 (27.1%)	128 (34.3%)	34 (9.1%)
Telemedicine improves my access to healthcare services	28 (7.5%)	11 (2.9%)	138 (37%)	109 (29.2%)	87 (23.3%)
I needed assistance while using the system	68 (18.2%)	38 (10.2%)	147 (39.4%)	77 (20.6%)	43 (11.5%)
Telemedicine format is confusing or complicated	100 (26.8%)	133 (35.7%)	55 (14.7%)	45 (12.1%)	40 (10.7%)
Ability to understand the recommendations or diagnosis made	40 (10.7%)	23 (6.2%)	124 (33.2%)	158 (42.4%)	28 (7.5%)
It saved me time travelling to hospital	28 (7.5%)	10 (2.7%)	102 (27.3%)	134 (35.9%)	99 (26.5%)

Overall satisfied with the service	40 (10.7%)	36 (9.7%)	89 (239%)	155 (41.6%)	53 (14.2%)
Will recommend to others	29 (7.8%)	48 (12.9%)	89 (23.9%)	151 (40.5%)	56 (15%)
Will use the service again	55 (14.7%)	22 (5.5%)	95 (25.5%)	144 (38.6%)	57 (15.3%)

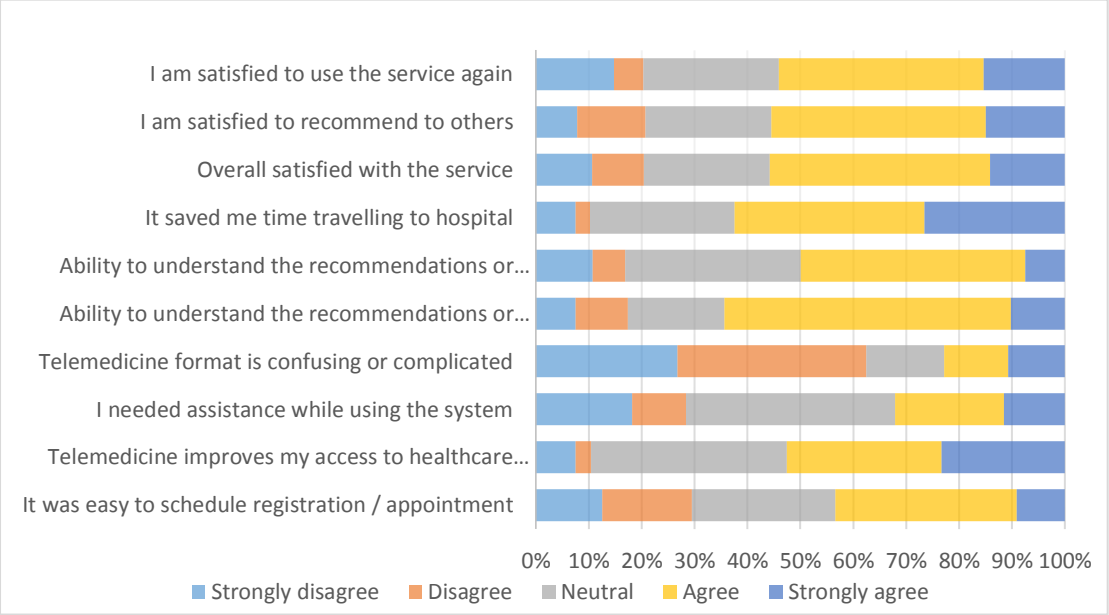

Figure 4. Percentage distribution of availability response of service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

5.2.5 Overall patients' satisfaction with Telemedicine service

Among the 373 respondents, 57.4% were satisfied with the telemedicine service provided while the other 42.6% are not satisfied.

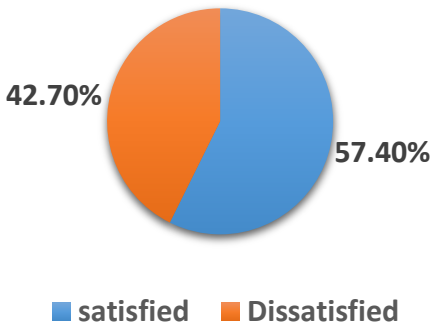

Figure 5. Overall satisfaction on assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

5.3 Factors associated with patient satisfaction

In Bi variate analysis among the Socio demographic characteristics of respondents' service user, age, gender showed significant statistical association with patient satisfaction whereas educational and occupational status did not have statistical association. Service users for others (COR= 1.51, 95%CI; 0.99-2.29), was more likely to be associated with patient satisfaction as compared to users for themselves.

Patients age between 35-44(COR=0.61, 95%CI;0.31-1.19)was more likely to be associated with patient satisfaction as compared to other age groups mentioned in the table below. Females (COR= 0.45, 95%CI; 0.29-0.68), were more likely to be associated with patient satisfaction as compared to males.

Among the clinical characteristic of respondents' those who used hotline type of telemedicine (COR= 0.689, 95%CI; 0.439-1.080), patients who spent 30- 60 min with the doctor to discuss about your problems(COR= 0.230, 95%CI; 0.02-2.29), patients with no previous experience(COR= 0.53, 95%CI; 0.34-0.83), patients with negative cost perception(COR= 0.52, 95%CI; 0.34-0.79) showed significant statistical association than their counter parts.

5.4 Multi variate analysis

Variables with p-value less than 0.25 on bi variate analysis were entered to multivariate analysis. Among these variables are age, gender, those who used hotline type of telemedicine, patients with no previous experience, patients with negative cost perception were the independent predictors of overall patient satisfaction of telemedicine service.

Patients with age group between 35 to 44 are 66% less likely to be satisfied with the telemedicine as compared to patients <18 years of age(AOR=0.341, 95%CI; 0.127-0.919), and females were 0.23 times less likely to be satisfied than males(AOR=0.233, 95%CI; 0.128-0.425). A telemedicine service using hotline number was 0.6 times (AOR = 0.607,95%CI;0.369-0.999) less likely to be satisfied compared to patients who used telephone for telemedicine service. Patients with no previous experience 71.3% less likely to be satisfied with the telemedicine as compared to patients with previous experience(AOR=0.287, 95%CI; 0.161-.513). Patients who thought the service was inexpensive were 58% less likely to be satisfied than type one who did not. (AOR =0.422, 95% CI; 0.247-0.719)

Table 6 . Bivariate and multivariate binary logistic regression of factors associated with telemedicine satisfaction for service users in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023(n=373)

Variable	Overall satisfaction		COR(CI 95%)	AOR(CI 95%)	Pvalue
	satisfied	Not satisfied			
1. For whom are you using the service?					
self	77(51.3%)	73(48.7%)	1		
others	137(61.4%)	86(38.6%)	1.51(.99-2.29)	0.73(0.34-1.55)	.408
2. Age					
<18	33(58.9%)	23(41.1%)	1		
18 - 24	15(62.5%)	9(37.5%)	1.16(0.43-3.10)	1.65(0.45-6.06)	.45
25 -34	14(56%)	11(44%)	0.887(.34-2.29)	0.89(0.25-3.10)	.848
35-44	42(46.7%)	48(53.3%)	0.61(0.31-1.19)	0.34(0.13-0.92)	**.034****
45-54	55(57.3%)	41(42.7%)	0.94(0.48-1.82)	.980(0.43-2.23)	.961
55-64	23(67.6%)	11(32.4%)	1.46(0.59-3.56)	1.29(0.48-3.42)	.615
≥65	32(66.7%)	16(33.3%)	1.39(0.63-3.11)	1.12(0.45-2.73)	.825
3. Gender					
male	122(67.4%)	59(32.6%)	1		
female	92(47.9%)	100(52.1%)	0.45(0.29-0.68)	0.23(0.13-0.43)	**0.00****
4. Which type of telemedicine did you use?					
Telephone	90(62.5%)	54(37.5%)	1		
Virtual clinic	31(56.4%)	24(43.6%)	0.78(0.41-1.46)	0.57(0.28-1.14)	.112
Hotline	93(53.4%)	81(46.6%)	0.69(0.44-1.08)	0.61(0.37-0.99)	**.049****
5. Which healthcare clinic did you attend using telemedicine?					
Internal medicine	60(40.5%)	88(59.5%)	1		
Pediatric	36(48.6%)	38(51.4%)	0.57(0.30-1.06)		
Surgery	34(44.2%)	43(55.8%)	0.82(0.44-1.52)		

Obstetrics and gynecology	29(39.2%)	45(60.8%)	1.09(0.59-2.04)		
6. How much time your doctors devote to you to discuss about your problems?					
<15 min	55(59.1%)	38(40.9%)	4.34(0.44-43.3)		
15-30 min	155(59.4%)	106(40.6%)	4.23(0.44-41.2)		
30-60 min	3(27.3%)	8(72.7%)	0.23(0.02-2.29)		
>60 min	1(12.5%)	7(87.5%)	1		
7. Is this your first time visiting the Telemedicine service?					
yes	126(52.1%)	116(47.9%)	1	1	
No	88(67.2%)	43(32.8%)	0.53(0.34-0.83)	0.29(0.16-0.51)	**0.00****
8. Did you think the service is expensive?					
yes	80(48.5%)	85(51.5%)	1	1	
No	134(64.4%)	74(35.6%)	0.52(.343-.789)	.422(.247-.719)	**0.02****

* Statistically significant in bi variate

1= Constant Variable

AOR=adjusted odd ratio

COR=crude odd ratio

** Statistically significant in multivariate

6. Discussion

The current study showed that 57.4% overall patient satisfaction in telemedicine service. The study attempted to determine the level of patient satisfaction and associated factors among service users of telemedicine, However, there is a limited literature regarding the patient satisfaction of telemedicine service, particularly in Ethiopia where there are plenty of service providing organizations. Therefore, this institution based cross-sectional research study attempts to assesses the level of patient satisfaction and factors associated telemedicine service providing organizations, Addis Ababa, Ethiopia.

Findings from this study showed that overall patient satisfaction in telemedicine service 205(57.4%), when compared with the developed countries like UAE (81%), Saudi Arabia (77.9%), New York City (94.9%), and Los Angeles (82.7%) and developing countries including Philippines (82%), India (73.9%), is lower this is could be due to study area difference, sample population difference, technological advancement and community awareness about the service. But this study's results are higher than studies conducted Iran (43.4%) and Bangladesh (53.8%) this could be because of study area difference, sample population difference, political instability in the other countries.

Convenience, comfort, ease of access, limitation of waiting time, the maintenance of privacy and confidentiality of the patients were found to be the major factors influencing the patient satisfaction level toward telemedicine among studies done in Philippines, North India, Saudi Arabia, Pakistan[12,22-23,20].While the current study findings showed that age, gender, type of telemedicine, previous experience, patient perception towards cost of telemedicine service were found to be associated with overall satisfaction of service users. All the reviewed studies were done during the pandemic of COVID-19. While this study was done post the pandemic, Hence this can be the main reason behind the difference in identification of factors associated with the over all satisfaction of the telemedicine service among with other reasons like difference in study setting and design. Moreover, This study tried to focus on the individual factors, accessibility and availability of telemedicine in order to identify factors associated which were also mentioned on the other studies.

The findings from the current study showed that age had a significant association indicating that participants with an age ranging from 35 to 44 years were more satisfied than other age groups and male were more likely to be satisfied. While other studies show differently for instance study done in Saudi Arabia reported that, participants with an age ranging from 18 to 25 years had a significantly higher mean satisfaction score compared to other participants and

also demonstrated that females were significantly more satisfied with the service compared to males (p-value =0.027), and a study done in Philippines and North India did not show any association. A study from Pakistan showed that gender, education, and age were significantly associated with the ease in technology which is one of the components of overall satisfaction indicators However, the difference viewed in this study and the one done in Saudi Arabia, may be for the reason that the young age with more familiarity with the use of technology.the other difference can be due to difference in sample size, research design and study area.

Another significant variable identified in this study that is associated with the lower satisfaction regarding the telemedicine is first-time service use that is reported as respondents with no previous experience are 72.8% less likely to be satisfied, But in other studies like Saudi Arabia they are 3.28 times more likely to be satisfied. The reason behind can be since telemedicine service is a relatively new concept, patients who attended first time might not know how to use it and the may not be well-informed about the service. The other reviewed studies did not mention previous experience and satisfaction association.

The type of telemedicine service used is one of the variables found to be associated with telemedicine satisfaction in the current study. While other countries and their studies included use of telemedicine facilities which can be utilized by various platforms such as telephones, video conferences, text messaging, emails, and other telemedicine applications,this study showed three types of telemedicine platforms, these are hotline, telephone and virtual. Studies done in Philippine and Saudi Arabia reported that, patients who had video consultations instead of telephone consultations were statistical significantly associated with satisfaction. Whereas I the current study, it was shown that hotline telemedicine service was significantly associated with overall satisfaction. Despite similarity between virtual and actual face to face communication rather than voice only.This can be due to issues related with network connection and cost effectiveness relatively to the other platforms and also difference in study area setting and sample size .

7. Strengths and limitations

Strengths

The strength of the study was the use of contextually adapted standardized questionnaire. The study was relatively quick and inexpensive to conduct and data on all variables are only collected at one time point.

Limitations

The limitations of these study was patients selected into the study were voluntarily selected and these may therefore not be a true reflection of the entire service users. There also may have been selection bias, Furthermore the sampling method used do not guarantee that the sample to be representative of the population, thus limiting the generalizability of the findings.

Lack of similar studies particularly in Ethiopia made difficult in comparing results.

8. Conclusion

In this study, the satisfaction level of telemedicine service users was found to be (57.4%),which was somehow higher as compared to other research conducted in a few developing countries. But lower when compared to developed countries and some developing countries. Being male, age, being first time user, hotline service were found to have a statistically significant association with consumer satisfaction. This study identified a number of potential determinants of satisfaction by using a specific, multidimensional satisfaction questionnaire that is based exclusively on patients' points of view. These factors might be amenable with intervention, which, in turn, might be expected to improve telemedicine satisfaction.

9. Recommendation

- Telemedicine patient satisfaction level should be determined frequently and all responsible bodies should work to reduce the factors which decrease the satisfaction level. Certain areas that need emphasis to improve telemedicine patient satisfaction include: more effort should be done in creating community awareness about the telemedicine, providing wide variety of options to access the telemedicine in affordable and accessible manner.
- It is also recommended that future studies be conducted with a departure interview after the patient discharge
- The telemedicine service providing organizations should try to identify the needs of service users continuously in order to assure their satisfaction and more emphasize on provision of quality care in order to increase the use of the telemedicine service in both rural and urban areas.
- Ministry of Health, Addis Ababa health bureau, FMHACA, telemedicine sevice providing organizations should have an integrated work to improve patient satisfaction and and provision of quality care of the telemedicine service.

10. References

1. Telemedicine Practice Guidelines, Enabling Registered Medical Practitioners to Provide Healthcare Using Telemedicine. Available from: https://www.mohfw.gov.in/pdf/Telemedicine.pdf?ncode=9b2ea8d633a211aac06c33b406c779dd

2. Telehealth Implementation Guideline Practical tips. Available from: https://iris.paho.org/bitstream/handle/10665.2/28414/9789275119037_eng.pdf

3. Kaur KN, Niazi F, Thakur R, Saeed S, Rana S, Singh H. Patient satisfaction for Telemedicine health services in the era of COVID-19 pandemic: A systematic review. Front Public Health [Internet]. 2022 Dec 16 ;10:1031867. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9800592/

4. Dodoo JE, Al-Samarraie H, Alsswey A. The development of Telemedicine programs in Sub-Saharan Africa: Progress and associated challenges. Health Technol (Berl) . 2022 ;12(1):33–46. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8613515/

5. Yip MP, Chang AM, Chan J, MacKenzie AE. Development of the Telemedicine Satisfaction Questionnaire to evaluate patient satisfaction with Telemedicine: a preliminary study. J Telemed Telecare . 2003 Feb 1;9(1):46–50. Available from: https://doi.org/10.1258/135763303321159693

6. Collins K, Nicolson P, Bowns I. Patient satisfaction in Telemedicine. Health Informatics J [Internet]. 2000 Jun 1 ;6(2):81–5. Available from: https://doi.org/10.1177/146045820000600205

7. (PDF) Predictive Factors of Patients' Satisfaction with Telemedicine Services Adoption: A Survey on Bangladesh's Perspective [Internet]. Available from: https://www.researchgate.net/publication/359668843_Predictive_Factors_of_Patients%27_Satisfaction_with_Telemedicine_Services_Adoption_A_Survey_on_Bangladesh%27s_Perspective

8. Nguyen M, Waller M, Pandya A, Portnoy J. A Review of Patient and Provider Satisfaction with Telemedicine. Curr Allergy Asthma Rep . 2020 Nov;20(11):72. Available from: https://link.springer.com/10.1007/s11882-020-00969-7

9. Lemma F, Atnafu S, Kassegne SK. Survey of Current Efforts and Potentials in Application of Telemedicine in Ethiopia.

10. Whitten P, Holtz B, LaPlante C. Telemedicine. Appl Clin Inform . 2010 May 5;1(2):132–41. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632278/

11. Factors Affecting Patient Perceptions and Satisfaction with Telemedicine in Outpatient Clinics [Internet]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8673882/

12. ETN Resource Center https://ethiopiantelemed.com/resources.

13. Evaluation of Patient Perception and Satisfaction Toward the Use of Telemedicine During Pandemic of Novel Coronavirus in Pakistan - PubMed . Available from: https://pubmed.ncbi.nlm.nih.gov/33449871/

14. Abdel Nasser A, Mohammed Alzahrani R, Al-falah CA, Muwafak Jreash D, Talea Almouled N, Salem Bakula D, et al. Measuring the Patients' Satisfaction About Telemedicine Used in Saudi Arabia During COVID-19 Pandemic. Cureus . 2021 Feb 16]; Available from: https://www.cureus.com/articles/51870-measuring-the-patients-satisfaction-about-Telemedicine-used-in-saudi-arabia-during-covid-19-pandemic

15. Orlando JF, Beard M, Kumar S. Systematic review of patient and caregivers' satisfaction with Telehealth videoconferencing as a mode of service delivery in managing patients' health. Borsci S, editor. PLoS ONE . 2019 Aug 30;14(8):e0221848. Available from: https://dx.plos.org/10.1371/journal.pone.0221848

16. Williams TL, May CR, Esmail A. Limitations of Patient Satisfaction Studies in Telehealthcare: A Systematic Review of the Literature. Telemedicine Journal and e-Health [Internet]. 2001 Dec;7(4):293–316. Available from: http://www.liebertonline.com/doi/abs/10.1089/15305620152814700

17. Kamimura A, Panahi S, Meng HW, Sundrud J, Lucero M. Patient Satisfaction With Telehealth and Experiences During the COVID-19 Pandemic Among Uninsured Free Clinic Patients. Journal of Patient Experience [Internet]. 2021 Jan 1;8:23743735211033108. Available from: https://doi.org/10.1177/23743735211033107

18. Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' Satisfaction with and Preference for Telehealth Visits. J Gen Intern Med [Internet]. 2016

Mar ;31(3):269–75. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4762824/

19. (PDF) Telemedicine, Cost Effectiveness, and Patients Satisfaction: A Systematic Review . Available from: https://www.researchgate.net/publication/343298714_Telemedicine_Cost_Effectiveness_and_Patients_Satisfaction_A_Systematic_Review

20. *Edoh T, Kora AD, Pawar P, Coulibaly G, Alahassa B. Predicting Telemedicine system user satisfaction in Sub-Saharan Africa. ICT Express. 2016 Nov 1;2.*

21. *Alfaleh, Amjad & Alkattan, Abdullah & Salah, Mohammed & Almutairi, Mona & Sagor, Khlood & Alageel, Alaa & Alabdulkareem, Khaled. (2021). Telemedicine and Patient Satisfaction in Saudi Arabia. 10.1101/2021.06.22.21259347.*

22. Noceda A, Acierto LM, Bertiz MC, Dionisio DE, Laurito CB, Sanchez GA, et al. Patient satisfaction with telemedicine in the Philippines during the COVID-19 pandemic: a mixed methods study. Res Square. doi: 10.1101/2022.05.21.22274939

23. Gupta AK, Paul S, Soni A, Kumar P, Nath B, Jotdar A. Patient's experience of telemedicine during COVID-19 pandemic in a tertiary care centre in North India: a telephonic survey. Int J Commun Med Public Health. (2021) 8:2517–22. doi: 10.18203/2394-6040.ijcmph2021 1785

24. Garcia R, Olayele A, Han W. Defining Dimensions of Patient Satisfaction with Telemedicine: An Analysis of Existing Measurement Instruments. In 2017. Available from: http://hdl.handle.net/10125/41617

25. *World population review: https://www.macrotrends.net/cities/20921/addis-ababa/population.*

26. Garcia R, Olayele A, Han W. Defining Dimensions of Patient Satisfaction with Telemedicine: An Analysis of Existing Measurement Instruments. In 2017 [cited 2023 Jan 1]. Available from: http://hdl.handle.net/10125/41617

Annex 1: Participant's Information Sheet

Title of the research project: Assessment of patient satisfaction and associated factors in Telemedicine service providing organizations in Addis Ababa, Ethiopia

Name of principal investigator: Kenean Mitiku

Name of the Organization: Addis Ababa University, College of Health Sciences, School of Public Health

Introduction: patient satisfaction is an important component in provision of healthcare service. it is positively correlated with the quality care provided. This study will provide to fill the gap on existing literature with undeniably relevant information regarding the patient satisfaction and factors associated in Telemedicine service.

Aim of the study: The aim of this study is to assess level of patient satisfaction and associated factors among service users of Telemedicine service providing organizations in Addis Ababa city.

Procedure and duration: You are one of participant selected by non-probability voluntary sampling method for this study. Appreciating your participation, if you are willing to participate in the study, there will be maximum of 15 minute questionnaire to be filled

Benefit and risk : Participation will not have any direct financial or other benefit for the participant, but the information is very crucial to achieve the objective of the research and to make valid conclusion on the factors associated with patient satisfaction in Telemedicine service. Further, the finding of this study would help local and national decision makers and organizations.

Confidentiality: The information collected from this study will be kept confidential and information reviewed will be stored being coded.

Rights to refusal or Withdrawal: Participation is purely voluntary; it is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not have any impact on the service you are getting now and the future.

Annex 2: Introduction and Consent form

Dear Sir/Madam

My Name is Kenean Mitiku. I am a student at Addis Ababa University in master of public health with specialty in health system management. I want to study the research thesis assessing patient satisfaction and factors associated with Telemedicine service providing organizations in Addis Ababa. As you know there has been an increase in usage of Telemedicine services in our country but there is knowledge gap on patient satisfaction with the service, Therefore, I want to study the factors associated with Telemedicine patient satisfaction. I am requesting your response to the questions related to patient satisfaction after your session. You can stop at any time while answering the self-administered questionnaire. While your cooperation in answering every question will help us understand important questions with regards to Telemedicine satisfaction, you are not obligated to answer every question. It will take about 15 minutes maximum to complete the questionnaire.

If you are willing and able to provide the information, please present your consent below.

Do you agree to participate?

1. Yes 2. No

Consent Form

I have read to the information sheet above and clearly understood the purpose and anticipated benefit of the research. I hereby need to assure that I have decided to voluntarily participate in the study, to contribute my part in the effort being made.

Participant unique ID No_____ Signature _____ Date_____

Date of interview_____ Time started_____ Time finished_____

For any information you can contact:

Mrs. Kenean Mitiku

Email: keneanmitiku@gmail.com

Tel: +251947481992

Annex 3: English Version Questionnaire

Questionnaire sheet on the study of Assessment of patient satisfaction associated factors in Telemedicine service providing organizations in Addis Ababa, Ethiopia

Questionnaire ID: _____

Table 7 Questionnaire assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

Part 1. Socio-demographic information			**skip**
1	For whom are you using the service	1) Self 2) others	
2	If answered for others, what is your relation with the patient?	1) Spouse 2) Mother/ father 3) Son/ daughter 4) Relatives 5) other	
3	Age of the patient	1) <18 2) 18 - 24 3) 25 -34 4) 35-44 5) 45-54 6) 55-64 7) ≥65	
4	Gender of the patient	1) Male 2) Female	
5	Educational status	1) Illiterate 2) Can read and write 3) Primary school 4) Secondary school 5) Diploma 6) Degree 7) masters and above	
6	Occupation	1) Student 2) Self employed 3) Employed 4) Unemployed 5) housewife 6) Other(Specify)_____	
Part 2. Service use information			
1	Type of telemedicine used	1) Telephone 2) Virtual clinic 3) Hotline	
2	Type of health clinic attended	1) Internal medicine 2) Pediatrics 3) Surgery 4) Gynecologic and obstetrics	

3	Is this your first time visiting the Telemedicine service?	1) yes 2) No	
4	How did you know about the Telemedicine service?	1) A friend 2) Medical staff 3) Social media 4) TV or radio promotion 5) Other(Specify)_____	
5	Did you think the service is expensive?	1) Yes 2) No	
6	Do you think telehealth services made healthcare easier today?	1) Yes 2) No	
7	How much time did it take to schedule your appointment or registration?	1) Less than 15 min 2) 15- 30 min 3) 30- 60 min 4) More than 60 min	
8	How much time your doctors devote to you to discuss about your problems?	1) Less than 15 min 2) 15- 30 min 3) 30- 60 min 4) More than 60 min	
9	How much did you pay for the Telemedicine service	1) <300 ETB 2) 500 ETB 3) 500-1000 ETB 4) > 1000 ETB	

Part 3. Factors associated with satisfaction		**Strongly agree (5)**	**agree (4)**	**Neutral (3)**	**Disagree(2)**	**Strongly disagree (1)**
1	It was easy to schedule registration / appointment					
2	I can see the health provider clearly					
3	I can hear the health provider very clearly					
4	I was able to talk freely over telemedicine					
5	I felt comfortable during communication with the health provider.					
6	I need assistance while using the system					
7	I find telemedicine format to be confusing or complicated					
8	Telemedicine improves my access to healthcare services.					
9	Telemedicine saves me time travelling to hospital					
10	Ability to understand the recommendations or diagnosis made					

11	My provider explained how my confidentiality is protected.					
12	My privacy was respected.					
13	Telemedicine is an acceptable way to receive healthcare services					
14	How satisfied are you with the overall Telemedicine consult experience					
15	How satisfied are you to recommend your kind of treatment to someone else?					
16	How satisfied are you to use this service again?					

Annex 4: Introduction and Consent form amharic version

እንደምን አደሩ / ዋሉ?

ከነአን ምትኩ እባላለሁ፤ በ አዲስ አበባ ዩኒቨርስቲ ህብረተሰብ ሳይንስ ጤና ሁለተኛ ዲግሪ ተማሪ ነኝ። ሁለተኛ ዲግሪዬን ለመመረቅ የቴሌምድስን የታካሚዎችን እርካታና እና ተያያዥ ወሳኝ ጉዳዮችን በተመለከተ በአዲስ አበባ ከተማ የሚገኙ ተቋማትን አገልግሎት የሚገመግም ምርምር ማድረግ እፈልጋለሁ።

እንደሚታወቀው በሀገራችን የሚገኙ የቴሌሜዲስን አገልግሎት የሚሰጡ ተቋማት ቁጥር ጭማሪ ቢኖርም በአገልግሎቱ እርካታ ጋር በተያያዘ ግን የዕውቀት ክፍተት አለ፤ ስለዚህም እኔ ምክንያቶቹን ማጥናት እፈልጋለሁ። ስለሆነም ፈቃደኛ ከሆንክ/ሽ ከቀረበል/ሽአገልግሎት በኋላ ከታካሚ እርካታ ጋር በተያያዘ ለሚነሱ ጥያቄዎች መልስ ስጥ/ጪ ።

የእርስዎ ተሳትፎ ሙሉ በሙሉ የእርስዎ ፈቃደኝነት ላይ ተመሰረተና በጥናቱ መሳተፍ ያለመሳተፍ መብት አሎዎት፡፡ ለመሳተፍ ፈቃደኛ ከሆኑ በኋላም በፈለጉት ጊዜ ማቋረጥ ወይም ማቆም ይችላሉ፡፡ በጥናቱ ባለመሳተፍዎ የሚደርስብዎት ጉዳት የለም፡፡ በጥናቱ ለመሳተፍ ከተስማሙ ከቴሌሜዲስን አገልግሎት እርካታ ጋር በተያያዘ ስለራሰዎ ልምድ እስከ 15 ደቂቃ ሊወስድ የሚችል የተወሰኑ ጥያቄዎች እንጠይቆታለን፡፡

ከጥናቱ የቴሌሜዲስን አገልግሎት የታካሚዎች እርካታ ከታካሚዎችህ አንጻር እንዴት እንደሆነ ይረዳሉ፡፡ ከዚህም በተጨማሪ የጥናቱ ውጤት የቴሌሜዲስን አገልግሎት የታካሚዎች እርካታ ይበልጥ ለማሻሻል በዚህ ዙሪያ ልሚሰሩ አካላት እንደመነሻ ሆኖ ያገለግላል፡፡ከላይ በተሰጦት መረጃ መሰረት በዚህ ጥናት ለመሳተፍ ፈቃደኛ ኖት?

1) አዎ ነኝ 2) አይደለሁም

ስምምነት ፎርም

ከላይ ያለውን የመረጃ ወረቀት አንብቤ አላማውን እና የሚያስገኘው ጥቅም በግልጽ ተረድቻለሁ። ለጥናቱ የበኩሌን አስተዋጽኦ ለማበርከት በጥናቱ ለመሳተፍ ፍቃደኝነቴን እገልጻለሁ፤ ውሳኔዬንም በዚህ ምልአተ ጉባኤ ላይ አረጋግጣለሁ።

የተሳታፊ ልዩ ቁጥር_____

ፊርማ _____ቀን _____

መጠይቁ የተካሄደበት ቀን _____የተጀመረበት ሰአት ____ የተጠናቀቀበት ሰአት ____

ለማንኛውም አይነት ጥያቄ

ሞባይል፡ 0947481992

ኢሜል፡ keneanmitiku@gmail.com

Annex 5: Amharic version questionnaire

የቴሌምድስን የታካሚዎችን እርካታና እና ተያያዥ ወሳኝ ጉዳዮችን በ አዲስ አበባ የሚገኙ ተቋማትን አገልግሎት ላይ ምርምር ማድረግ በተመለከተ የተዘጋጀ መጠይቅ

የተሳታፊ ልዩ ቁጥር_____

Table 8 Amharic version questionnaire assessment of patient satisfaction in Telemedicine service providing organizations in Addis Ababa, Ethiopia, 2023

ክፍል፣ ማህበራዊ ጉዳዮችን በተመለከተ የተዘጋጀ መጠይቅ			ዝለል
ነ	አገልግሎት ተጠቃሚ	ነ) ለራሴ 2) ለሌላ	
2	ለሌላ ከሆነ ከታካሚው ጋር ያለው ግንኙነት	ነ) የጋብቻ 2) እናት/አባት 3) ልጅ 4) ዘመድ 5) ሌላ(ግለጽ)_____	
3	እድሜ	ነ) <18 2) 18 - 24 3) 25 -34 4) 35-44 5) 45-54 6) 55-64 7) ≥65	
4	የጸታ	ነ) ወንድ 2) ሴት	
5	የትምህርት ደረጃ	ነ) ማንበብና ምፃፍ አልችልም 2) ማንበብና ምፃፍ 3) አንደኛ ደርጃ 4) ሁለተኛ ደርጃ 5) ዲፕሎማ 6) ዲግሪ 7) ማስተርስ እና ከዛ በላይ	
6	ስራ	ነ) ተማሪ 2) የግል ስራ 3) ተቀጣሪ 4) ስራ አጥ 5) የቤት እመቤት 6) ሌላ (ይጠቀስ)_____	
ክፍል 2 ስለ አገልግሎቱ			
1	የተጠቀሙት የቴሌሜዲስን አይነት	ነ) የስልክ ጥሪ 2) ቨርቹዋል ክሊኒክ 3) የአጭርቁጥር ጥሪ	
2	የተጠቀሙት የጤና ክሊኒክ ዓይነት	ነ) የውስጥ ደዌ 2) ህጻናት 3) ቀዶ ጥገና 4) የማህፀን እና ፅንስ	
3	የመጀመሪያ ጊዜዎት ነው አገልግሎቱን ሲጠቀሙ?	ነ) አዎ ነው 2) አይደለም	
4	ስለቴሌምድስን ከየት ሰሙ?	ነ) ከጓደኛ 2) ከ ህክምና ባለሙያ 3) ማህበራዊ ሚዲያ	

		4) ማስታወቂያ 5) ሌላ (ይጠቀስ)_____	
5	የቴሌምድስን አገልግሎቱ ክፍያ ውድ ነው ብለው ያስባሉ?	ነ) አዎ ነው 2) አይደለም	
6	የቴሌምድስን አገልግሎት ዛሬ የጤና እንክብካቤን ቀላል ያደረገ ይመስልዎታል?	ነ)አዎ ነው 2)አይደለም	
7	ለመመዝገብ/ ቀጠሮ ለማሲያዝ ምን ያህል ጊዜ ፈጀቦት?	ነ) ከ15 ደቂቃ በታች 2) 15- 30 ደቂቃ 3) 30- 60 ደቂቃ 4) ከ60 ደቂቃ በላይ	
8	ከሃኪሞ ጋር የነበሮት ቆይታ?	ነ) ከ15 ደቂቃ በታች 2) 15- 30 ደቂቃ 3) 30- 60 ደቂቃ 4) ከ60 ደቂቃ በላይ	
9	የቴሌምድስን አገልግሎቱን ለማግት ምን ያህል ከፈሉ?	1) <300 ETB 2) 301-500 ETB 3) 501-1000 ETB 4) > 1000 ETB	

ክፍል 3 ተያያዥ ወሳኝ ጉዳዮች		(5) በደንብ እስማማለሁ	(4) እስማማለሁ	(3)አላውቅም	(2) አልስማማም	(ነ)በፍጹም አልስማማም
ነ	ለመመዝገብ/ ቀጠሮ ለማሲያዝ ቀላል ነበር።					
2	አገልግሎቱን በግልፅ ማየት እችል ነበር።					
3	አገልግሎቱን በግልፅ መስማት እችል ነበር።					
4	በቴሌምድስን አገልግሎቱ ጊዜ በነፃነት ማውራት ችያለሁ።					
5	በቴሌምድስን አገልግሎቱ ጊዜ ምቾት ተሰምቶኛል።					
6	አጠቃቀም ላይ እርዳታ አስፈልጎኝ ነበር።					
7	የቴሌሜዲሲን ፎርማት ግራ የሚያጋባ ወይም የተወሳሰበ ሆኖ አግኝቼዋለሁ።					
8	ቴሌሜዲሲን የጤና አጠባበቅ አገልግሎቶችን ተደራሽነት ያሻሽላል።					
9	ቴሌምድስን አገልግሎቱ ጊዜ ቆጥቦልኛል።					
ነ0	የተደረጉትን ምክሮች ወይም የምርመራ ዘዴዎች በቀላሉ ተረድቻለሁ።					
ነነ	የአገልግሎት ሚስጥራዊነት እንዴት እንደሚጠበቅ ተብራርቶልኛል።					
ነ2	ግላዊነቴ ተጠብቆልኛል።					
ነ3	ቴሌሜዲሲን የጤና እንክብካቤ አገልግሎቶችን ለማቅረብ ተቀባይነት ያለው መንገድ ነው።					
ነ4	በጠቅላላ በቴሌምድስን አገልግሎቱ እርካታ አጊቻለሁ።					
ነ5	በቴሌምድስን አገልግሎቱ ሰለረካሁ ለሌላ ሰው ጥቆማ እሰጣለሁ።					
ነ6	በቴሌምድስን አገልግሎቱ ሰለረካሁ በሌላ ጊዜ በድጋሚ እጠቀማለሁ።					